

# SEQUENCE LISTING

<110> Wilson, James M.  
Xiao, Weidong

<120> Adeno-Associated Virus Serotype I Nucleic Acid Sequences,  
Vectors and Host Cells Containing Same

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<140> US 09/807,802  
<141> 2001-04-17

<150> US 60/107,114  
<151> 1998-11-05

<150> PCT/US99/25694  
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<170> PatentIn version 3.1

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 Val Gln Trp Arg Arg Val Ser Lys Ala Pro Glu Ala Leu Phe Phe Val  
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Glu Glu Val Pro Phe His Ser Ser Tyr Ala His Ser Gln Ser Leu Asp						
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Arg Leu Met Asn Pro Leu Ile Asp Gln Tyr Leu Tyr Tyr Leu Asn Arg						
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Gly Pro Cys Tyr Arg Gln Gln Arg Val Ser Lys Thr Lys Thr Asp Asn						
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Asn Asn Ser Asn Phe Thr Trp Thr Gly Ala Ser Lys Tyr Asn Leu Asn						
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Gly Arg Glu Ser Ile Ile Asn Pro Gly Thr Ala Met Ala Ser His Lys						
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Asp Asp Glu Asp Lys Phe Phe Pro Met Ser Gly Val Met Ile Phe Gly						
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 Gln Lys Arg Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala  
 100 105 110  
 Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Ala Val Pro  
 115 120 125  
 Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp

130	135	140
Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala		
145	150	155 160
Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg		
	165	170 175
Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val		
	180	185 190
Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser		
	195	200 205
Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe		
	210	215 220
Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln		
	225	230 235 240
Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val		
	245	250 255
Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala		
	260	265 270
Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val		
	275	280 285
Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala		
	290	295 300
Asp Arg Tyr Gln Asn Lys Cys Ser Arg His Ala Gly Met Leu Gln Met		
	305	310 315 320
Leu Phe Pro Cys Lys Thr Cys Glu Arg Met Asn Gln Asn Phe Asn Ile		
	325	330 335
Cys Phe Thr His Gly Thr Arg Asp Cys Ser Glu Cys Phe Pro Gly Val		
	340	345 350
Ser Glu Ser Gln Pro Val Val Arg Lys Arg Thr Tyr Arg Lys Leu Cys		
	355	360 365
Ala Ile His His Leu Leu Gly Arg Ala Pro Glu Ile Ala Cys Ser Ala		
	370	375 380
Cys Asp Leu Val Asn Val Asp Leu Asp Asp Cys Val Ser Glu Gln		
	385	390 395

<210> 10  
 <211> 969  
 <212> DNA  
 <213> AAV-1

<220>  
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 <222> (1)..(966)  
 <223>



<220>  
 <221> misc\_feature  
 <222> (943)..(944)  
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 Met Glu Leu Val Gly Trp Leu Val Asp Arg Gly Ile Thr Ser Glu Lys  
 1 5 10 15

cag tgg atc cag gag gac cag gcc tcg tac atc tcc ttc aac gcc gct 96  
 Gln Trp Ile Gln Glu Asp Gln Ala Ser Tyr Ile Ser Phe Asn Ala Ala  
 20 25 30

tcc aac tcg cgg tcc cag atc aag gcc gct ctg gac aat gcc ggc aag 144  
 Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys  
 35 40 45

atc atg gcg ctg acc aaa tcc gcg ccc gac tac ctg gta ggc ccc gct 192  
 Ile Met Ala Leu Thr Lys Ser Ala Pro Asp Tyr Leu Val Gly Pro Ala  
 50 55 60

ccg ccc gcg gac att aaa acc aac cgc atc tac cgc atc ctg gag ctg 240  
 Pro Pro Ala Asp Ile Lys Thr Asn Arg Ile Tyr Arg Ile Leu Glu Leu  
 65 70 75 80

aac ggc tac gaa cct gcc tac gcc ggc tcc gtc ttt ctc ggc tgg gcc 288  
 Asn Gly Tyr Glu Pro Ala Tyr Ala Gly Ser Val Phe Leu Gly Trp Ala  
 85 90 95

cag aaa agg ttc ggg aag cgc aac acc atc tgg ctg ttt ggg ccg gcc 336  
 Gln Lys Arg Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala  
 100 105 110

acc acg ggc aag acc aac atc gcg gaa gcc atc gcc cac gcc gtg ccc 384  
 Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Ala Val Pro  
 115 120 125

ttc tac ggc tgc gtc aac tgg acc aat gag aac ttt ccc ttc aat gat 432  
 Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp  
 130 135 140

tgc gtc gac aag atg gtg atc tgg tgg gag gag ggc aag atg acg gcc 480  
 Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala  
 145 150 155 160

aag gtc gtg gag tcc gcc aag gcc att ctc ggc ggc agc aag gtg cgc 528  
 Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg  
 165 170 175

gtg gac caa aag tgc aag tcg tcc gcc cag atc gac ccc acc ccc gtg 576  
 Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val  
 180 185 190

atc gtc acc tcc aac acc aac atg tgc gcc gtg att gac ggg aac agc 624  
 Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser  
 195 200 205

acc acc ttc gag cac cag cag ccg ttg cag gac cgg atg ttc aaa ttt 672

Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe  
 210 215 220  
 gaa ctc acc cgc cgt ctg gag cat gac ttt ggc aag gtg aca aag cag 720  
 Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln  
 225 230 235 240  
 gaa gtc aaa gag ttc ttc cgc tgg gcg cag gat cac gtg acc gag gtg 768  
 Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val  
 245 250 255  
 gcg cat gag ttc tac gtc aga aag ggt gga gcc aac aaa aga ccc gcc 816  
 Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala  
 260 265 270  
 ccc gat gac gcg gat aaa agc gag ccc aag cgg gcc tgc ccc tca gtc 864  
 Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val  
 275 280 285  
 gcg gat cca tcg acg tca gac gcg gaa gga gct ccg gtg gac ttt gcc 912  
 Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala  
 290 295 300  
 gac agg tat ggc tgc cga tgg tta tct tcc aga ttg gct cga gga caa 960  
 Asp Arg Tyr Gly Cys Arg Trp Leu Ser Ser Arg Leu Ala Arg Gly Gln  
 305 310 315 320  
 cct ctc tga 969  
 Pro Leu

<210> 11  
 <211> 322  
 <212> PRT  
 <213> AAV-1

<220>  
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 <222> (943)..(944)  
 <223> minor splice site

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 1 .. 5 10 15  
 Gln Trp Ile Gln Glu Asp Gln Ala Ser Tyr Ile Ser Phe Asn Ala Ala  
 20 25 30  
 Ser Asn Ser Arg Ser Gln Ile Lys Ala Ala Leu Asp Asn Ala Gly Lys  
 35 40 45  
 Ile Met Ala Leu Thr Lys Ser Ala Pro Asp Tyr Leu Val Gly Pro Ala  
 50 55 60  
 Pro Pro Ala Asp Ile Lys Thr Asn Arg Ile Tyr Arg Ile Leu Glu Leu  
 65 70 75 80  
 Asn Gly Tyr Glu Pro Ala Tyr Ala Gly Ser Val Phe Leu Gly Trp Ala  
 85 90 95

Gln Lys Arg Phe Gly Lys Arg Asn Thr Ile Trp Leu Phe Gly Pro Ala  
 100 105 110  
 Thr Thr Gly Lys Thr Asn Ile Ala Glu Ala Ile Ala His Ala Val Pro  
 115 120 125  
 Phe Tyr Gly Cys Val Asn Trp Thr Asn Glu Asn Phe Pro Phe Asn Asp  
 130 135 140  
 Cys Val Asp Lys Met Val Ile Trp Trp Glu Glu Gly Lys Met Thr Ala  
 145 150 155 160  
 Lys Val Val Glu Ser Ala Lys Ala Ile Leu Gly Gly Ser Lys Val Arg  
 165 170 175  
 Val Asp Gln Lys Cys Lys Ser Ser Ala Gln Ile Asp Pro Thr Pro Val  
 180 185 190  
 Ile Val Thr Ser Asn Thr Asn Met Cys Ala Val Ile Asp Gly Asn Ser  
 195 200 205  
 Thr Thr Phe Glu His Gln Gln Pro Leu Gln Asp Arg Met Phe Lys Phe  
 210 215 220  
 Glu Leu Thr Arg Arg Leu Glu His Asp Phe Gly Lys Val Thr Lys Gln  
 225 230 235 240  
 Glu Val Lys Glu Phe Phe Arg Trp Ala Gln Asp His Val Thr Glu Val  
 245 250 255  
 Ala His Glu Phe Tyr Val Arg Lys Gly Gly Ala Asn Lys Arg Pro Ala  
 260 265 270  
 Pro Asp Asp Ala Asp Lys Ser Glu Pro Lys Arg Ala Cys Pro Ser Val  
 275 280 285  
 Ala Asp Pro Ser Thr Ser Asp Ala Glu Gly Ala Pro Val Asp Phe Ala  
 290 295 300  
 Asp Arg Tyr Gly Cys Arg Trp Leu Ser Ser Arg Leu Ala Arg Gly Gln  
 305 310 315 320  
 Pro Leu

<210> 12  
 <211> 2211  
 <212> DNA  
 <213> AAV-1

<220>  
 <221> CDS  
 <222> (1)..(2208)  
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<400> 12  
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 Met Ala Ala Asp Gly Tyr Leu Pro Asp Trp Leu Glu Asp Asn Leu Ser

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gag ggc att cgc gag tgg tgg gac ttg aaa cct gga gcc ccg aag ccc				96
Glu Gly Ile Arg Glu Trp Trp Asp Leu Lys Pro Gly Ala Pro Lys Pro				
	20	25	30	
aaa gcc aac cag caa aag cag gac gac ggc cgg ggt ctg gtg ctt cct				144
Lys Ala Asn Gln Gln Lys Gln Asp Asp Gly Arg Gly Leu Val Leu Pro				
	35	40	45	
ggc tac aag tac ctc gga ccc ttc aac gga ctc gac aag ggg gag ccc				192
Gly Tyr Lys Tyr Leu Gly Pro Phe Asn Gly Leu Asp Lys Gly Glu Pro				
	50	55	60	
gtc aac gcg gcg gac gca gcg gcc ctc gag cac gac aag gcc tac gac				240
Val Asn Ala Ala Asp Ala Ala Ala Leu Glu His Asp Lys Ala Tyr Asp				
	65	70	75	
cag cag ctc aaa gcg ggt gac aat ccg tac ctg cgg tat aac cac gcc				288
Gln Gln Leu Lys Ala Gly Asp Asn Pro Tyr Leu Arg Tyr Asn His Ala				
	85	90	95	
gac gcc gag ttt cag gag cgt ctg caa gaa gat acg tct ttt ggg ggc				336
Asp Ala Glu Phe Gln Glu Arg Leu Gln Glu Asp Thr Ser Phe Gly Gly				
	100	105	110	
aac ctc ggg cga gca gtc ttc cag gcc aag aag cgg gtt ctc gaa cct				384
Asn Leu Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro				
	115	120	125	
ctc ggt ctg gtt gag gaa ggc gct aag acg gct cct gga aag aaa cgt				432
Leu Gly Leu Val Glu Glu Gly Ala Lys Thr Ala Pro Gly Lys Lys Arg				
	130	135	140	
ccg gta gag cag tcg cca caa gag cca gac tcc tcc tcg ggc atc ggc				480
Pro Val Glu Gln Ser Pro Gln Glu Pro Asp Ser Ser Ser Gly Ile Gly				
	145	150	155	
aag aca ggc cag cag ccc gct aaa aag aga ctc aat ttt ggt cag act				528
Lys Thr Gly Gln Gln Pro Ala Lys Lys Arg Leu Asn Phe Gly Gln Thr				
	165	170	175	
ggc gac tca gag tca gtc ccc gat cca caa cct ctc gga gaa cct cca				576
Gly Asp Ser Glu Ser Val Pro Asp Pro Gln Pro Leu Gly Glu Pro Pro				
	180	185	190	
gca acc ccc gct gct gtg gga cct act aca atg gct tca ggc ggt ggc				624
Ala Thr Pro Ala Ala Val Gly Pro Thr Thr Met Ala Ser Gly Gly Gly				
	195	200	205	
gca cca atg gca gac aat aac gaa ggc gcc gac gga gtg ggt aat gcc				672
Ala Pro Met Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Asn Ala				
	210	215	220	
tca gga aat tgg cat tgc gat tcc aca tgg ctg ggc gac aga gtc atc				720
Ser Gly Asn Trp His Cys Asp Ser Thr Trp Leu Gly Asp Arg Val Ile				
	225	230	235	
acc acc agc acc cgc acc tgg gcc ttg ccc acc tac aat aac cac ctc				768
Thr Thr Ser Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His Leu				

245	250	255	
tac aag caa atc tcc agt gct tca acg ggg gcc agc aac gac aac cac Tyr Lys Gln Ile Ser Ser Ala Ser Thr Gly Ala Ser Asn Asp Asn His 260 265 270			816
tac ttc ggc tac agc acc ccc tgg ggg tat ttt gat ttc aac aga ttc Tyr Phe Gly Tyr Ser Thr Pro Trp Gly Tyr Phe Asp Phe Asn Arg Phe 275 280 285			864
cac tgc cac ttt tca cca cgt gac tgg cag cga ctc atc aac aac aat His Cys His Phe Ser Pro Arg Asp Trp Gln Arg Leu Ile Asn Asn Asn 290 295 300			912
tgg gga ttc cgg ccc aag aga ctc aac ttc aaa ctc ttc aac atc caa Trp Gly Phe Arg Pro Lys Arg Leu Asn Phe Lys Leu Phe Asn Ile Gln 305 310 315 320			960
gtc aag gag gtc acg acg aat gat ggc gtc aca acc atc gct aat aac Val Lys Glu Val Thr Thr Asn Asp Gly Val Thr Thr Ile Ala Asn Asn 325 330 335			1008
ctt acc agc acg gtt caa gtc ttc tgc gac tgc gag tac cag ctt ccg Leu Thr Ser Thr Val Gln Val Phe Ser Asp Ser Glu Tyr Gln Leu Pro 340 345 350			1056
tac gtc ctc ggc tct gcg cac cag ggc tgc ctc cct ccg ttc ccg gcg Tyr Val Leu Gly Ser Ala His Gln Gly Cys Leu Pro Pro Phe Pro Ala 355 360 365			1104
gac gtg ttc atg att ccg caa tac ggc tac ctg acg ctc aac aat ggc Asp Val Phe Met Ile Pro Gln Tyr Gly Tyr Leu Thr Leu Asn Asn Gly 370 375 380			1152
agc caa gcc gtg gga cgt tca tcc ttt tac tgc ctg gaa tat ttc cct Ser Gln Ala Val Gly Arg Ser Ser Phe Tyr Cys Leu Glu Tyr Phe Pro 385 390 395 400			1200
tct cag atg ctg aga acg ggc aac aac ttt acc ttc agc tac acc ttt Ser Gln Met Leu Arg Thr Gly Asn Asn Phe Thr Phe Ser Tyr Thr Phe 405 410 415			1248
gag gaa gtg cct ttc cac agc agc tac gcg cac agc cag agc ctg gac Glu Glu Val Pro Phe His Ser Ser Tyr Ala His Ser Gln Ser Leu Asp 420 425 430			1296
cgg ctg atg aat cct ctc atc gac caa tac ctg tat tac ctg aac aga Arg Leu Met Asn Pro Leu Ile Asp Gln Tyr Leu Tyr Tyr Leu Asn Arg 435 440 445			1344
act caa aat cag tcc gga agt gcc caa aac aag gac ttg ctg ttt agc Thr Gln Asn Gln Ser Gly Ser Ala Gln Asn Lys Asp Leu Leu Phe Ser 450 455 460			1392
cgt ggg tct cca gct ggc atg tct gtt cag ccc aaa aac tgg cta cct Arg Gly Ser Pro Ala Gly Met Ser Val Gln Pro Lys Asn Trp Leu Pro 465 470 475 480			1440
gga ccc tgt tat cgg cag cag cgc gtt tct aaa aca aaa aca gac aac Gly Pro Cys Tyr Arg Gln Gln Arg Val Ser Lys Thr Lys Thr Asp Asn			1488

485	490	495	
aac aac agc aat ttt acc tgg act ggt gct tca aaa tat aac ctc aat Asn Asn Ser Asn Phe Thr Trp Thr Gly Ala Ser Lys Tyr Asn Leu Asn 500 505 510			1536
ggg cgt gaa tcc atc atc aac cct ggc act gct atg gcc tca cac aaa Gly Arg Glu Ser Ile Ile Asn Pro Gly Thr Ala Met Ala Ser His Lys 515 520 525			1584
gac gac gaa gac aag ttc ttt ccc atg agc ggt gtc atg att ttt gga Asp Asp Glu Asp Lys Phe Phe Pro Met Ser Gly Val Met Ile Phe Gly 530 535 540			1632
aaa gag agc gcc gga gct tca aac act gca ttg gac aat gtc atg att Lys Glu Ser Ala Gly Ala Ser Asn Thr Ala Leu Asp Asn Val Met Ile 545 550 555 560			1680
aca gac gaa gag gaa att aaa gcc act aac cct gtg gcc acc gaa aga Thr Asp Glu Glu Glu Ile Lys Ala Thr Asn Pro Val Ala Thr Glu Arg 565 570 575			1728
ttt ggg acc gtg gca gtc aat ttc cag agc agc agc aca gac cct gcg Phe Gly Thr Val Ala Val Asn Phe Gln Ser Ser Ser Thr Asp Pro Ala 580 585 590			1776
acc gga gat gtg cat gct atg gga gca tta cct ggc atg gtg tgg caa Thr Gly Asp Val His Ala Met Gly Ala Leu Pro Gly Met Val Trp Gln 595 600 605			1824
gat aga gac gtg tac ctg cag ggt ccc att tgg gcc aaa att cct cac Asp Arg Asp Val Tyr Leu Gln Gly Pro Ile Trp Ala Lys Ile Pro His 610 615 620			1872
aca gat gga cac ttt cac ccg tct cct ctt atg ggc ggc ttt gga ctc Thr Asp Gly His Phe His Pro Ser Pro Leu Met Gly Gly Phe Gly Leu 625 630 635 640			1920
aag aac ccg cct cct cag atc ctc atc aaa aac acg cct gtt cct gcg Lys Asn Pro Pro Pro Gln Ile Leu Ile Lys Asn Thr Pro Val Pro Ala 645 650 655			1968
aat cct ccg gcg gag ttt tca gct aca aag ttt gct tca ttc atc acc Asn Pro Pro Ala Glu Phe Ser Ala Thr Lys Phe Ala Ser Phe Ile Thr 660 665 670			2016
caa tac tcc aca gga caa gtg agt gtg gaa att gaa tgg gag ctg cag Gln Tyr Ser Thr Gly Gln Val Ser Val Glu Ile Glu Trp Glu Leu Gln 675 680 685			2064
aaa gaa aac agc aag cgc tgg aat ccc gaa gtg cag tac aca tcc aat Lys Glu Asn Ser Lys Arg Trp Asn Pro Glu Val Gln Tyr Thr Ser Asn 690 695 700			2112
tat gca aaa tct gcc aac gtt gat ttt act gtg gac aac aat gga ctt Tyr Ala Lys Ser Ala Asn Val Asp Phe Thr Val Asp Asn Asn Gly Leu 705 710 715 720			2160
tat act gag cct cgc ccc att ggc acc cgt tac ctt acc cgt ccc ctg Tyr Thr Glu Pro Arg Pro Ile Gly Thr Arg Tyr Leu Thr Arg Pro Leu			2208

taa

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 <212> PRT  
 <213> AAV-1

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 1 5 10 15  
 Glu Gly Ile Arg Glu Trp Trp Asp Leu Lys Pro Gly Ala Pro Lys Pro  
 20 25 30  
 Lys Ala Asn Gln Gln Lys Gln Asp Asp Gly Arg Gly Leu Val Leu Pro  
 35 40 45  
 Gly Tyr Lys Tyr Leu Gly Pro Phe Asn Gly Leu Asp Lys Gly Glu Pro  
 50 55 60  
 Val Asn Ala Ala Asp Ala Ala Ala Leu Glu His Asp Lys Ala Tyr Asp  
 65 70 75 80  
 Gln Gln Leu Lys Ala Gly Asp Asn Pro Tyr Leu Arg Tyr Asn His Ala  
 85 90 95  
 Asp Ala Glu Phe Gln Glu Arg Leu Gln Glu Asp Thr Ser Phe Gly Gly  
 100 105 110  
 Asn Leu Gly Arg Ala Val Phe Gln Ala Lys Lys Arg Val Leu Glu Pro  
 115 120 125  
 Leu Gly Leu Val Glu Glu Gly Ala Lys Thr Ala Pro Gly Lys Lys Arg  
 130 135 140  
 Pro Val Glu Gln Ser Pro Gln Glu Pro Asp Ser Ser Ser Gly Ile Gly  
 145 150 155 160  
 Lys Thr Gly Gln Gln Pro Ala Lys Lys Arg Leu Asn Phe Gly Gln Thr  
 165 170 175  
 Gly Asp Ser Glu Ser Val Pro Asp Pro Gln Pro Leu Gly Glu Pro Pro  
 180 185 190  
 Ala Thr Pro Ala Ala Val Gly Pro Thr Thr Met Ala Ser Gly Gly Gly  
 195 200 205  
 Ala Pro Met Ala Asp Asn Asn Glu Gly Ala Asp Gly Val Gly Asn Ala  
 210 215 220  
 Ser Gly Asn Trp His Cys Asp Ser Thr Trp Leu Gly Asp Arg Val Ile  
 225 230 235 240  
 Thr Thr Ser Thr Arg Thr Trp Ala Leu Pro Thr Tyr Asn Asn His Leu  
 245 250 255  
 Tyr Lys Gln Ile Ser Ser Ala Ser Thr Gly Ala Ser Asn Asp Asn His

260                      265                      270

Tyr Phe Gly Tyr Ser Thr Pro Trp Gly Tyr Phe Asp Phe Asn Arg Phe  
275                      280                      285

His Cys His Phe Ser Pro Arg Asp Trp Gln Arg Leu Ile Asn Asn Asn  
290                      295                      300

Trp Gly Phe Arg Pro Lys Arg Leu Asn Phe Lys Leu Phe Asn Ile Gln  
305                      310                      315                      320

Val Lys Glu Val Thr Thr Asn Asp Gly Val Thr Thr Ile Ala Asn Asn  
325                      330                      335

Leu Thr Ser Thr Val Gln Val Phe Ser Asp Ser Glu Tyr Gln Leu Pro  
340                      345                      350

Tyr Val Leu Gly Ser Ala His Gln Gly Cys Leu Pro Pro Phe Pro Ala  
355                      360                      365

Asp Val Phe Met Ile Pro Gln Tyr Gly Tyr Leu Thr Leu Asn Asn Gly  
370                      375                      380

Ser Gln Ala Val Gly Arg Ser Ser Phe Tyr Cys Leu Glu Tyr Phe Pro  
385                      390                      395                      400

Ser Gln Met Leu Arg Thr Gly Asn Asn Phe Thr Phe Ser Tyr Thr Phe  
405                      410                      415

Glu Glu Val Pro Phe His Ser Ser Tyr Ala His Ser Gln Ser Leu Asp  
420                      425                      430

Arg Leu Met Asn Pro Leu Ile Asp Gln Tyr Leu Tyr Tyr Leu Asn Arg  
435                      440                      445

Thr Gln Asn Gln Ser Gly Ser Ala Gln Asn Lys Asp Leu Leu Phe Ser  
450                      455                      460

Arg Gly Ser Pro Ala Gly Met Ser Val Gln Pro Lys Asn Trp Leu Pro  
465                      470                      475                      480

Gly Pro Cys Tyr Arg Gln Gln Arg Val Ser Lys Thr Lys Thr Asp Asn  
485                      490                      495

Asn Asn Ser Asn Phe Thr Trp Thr Gly Ala Ser Lys Tyr Asn Leu Asn  
500                      505                      510

Gly Arg Glu Ser Ile Ile Asn Pro Gly Thr Ala Met Ala Ser His Lys  
515                      520                      525

Asp Asp Glu Asp Lys Phe Phe Pro Met Ser Gly Val Met Ile Phe Gly  
530                      535                      540

Lys Glu Ser Ala Gly Ala Ser Asn Thr Ala Leu Asp Asn Val Met Ile  
545                      550                      555                      560

Thr Asp Glu Glu Glu Ile Lys Ala Thr Asn Pro Val Ala Thr Glu Arg  
565                      570                      575

Phe Gly Thr Val Ala Val Asn Phe Gln Ser Ser Ser Thr Asp Pro Ala



580                      585                      590  
 Thr Gly Asp Val His Ala Met Gly Ala Leu Pro Gly Met Val Trp Gln  
     595                      600                      605  
 Asp Arg Asp Val Tyr Leu Gln Gly Pro Ile Trp Ala Lys Ile Pro His  
     610                      615                      620  
 Thr Asp Gly His Phe His Pro Ser Pro Leu Met Gly Gly Phe Gly Leu  
     625                      630                      635                      640  
 Lys Asn Pro Pro Pro Gln Ile Leu Ile Lys Asn Thr Pro Val Pro Ala  
     645                      650                      655  
 Asn Pro Pro Ala Glu Phe Ser Ala Thr Lys Phe Ala Ser Phe Ile Thr  
     660                      665                      670  
 Gln Tyr Ser Thr Gly Gln Val Ser Val Glu Ile Glu Trp Glu Leu Gln  
     675                      680                      685  
 Lys Glu Asn Ser Lys Arg Trp Asn Pro Glu Val Gln Tyr Thr Ser Asn  
     690                      695                      700  
 Tyr Ala Lys Ser Ala Asn Val Asp Phe Thr Val Asp Asn Asn Gly Leu  
     705                      710                      715                      720  
 Tyr Thr Glu Pro Arg Pro Ile Gly Thr Arg Tyr Leu Thr Arg Pro Leu  
     725                      730                      735

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 <213> AAV-1

<220>  
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 <222> (1)..(1797)  
 <223>

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 Thr Ala Pro Gly Lys Lys Arg Pro Val Glu Gln Ser Pro Gln Glu Pro  
 1                      5                      10                      15  
 gac tcc tcc tcg ggc atc ggc aag aca ggc cag cag ccc gct aaa aag                      96  
 Asp Ser Ser Ser Gly Ile Gly Lys Thr Gly Gln Gln Pro Ala Lys Lys  
     20                      25                      30  
 aga ctc aat ttt ggt cag act ggc gac tca gag tca gtc ccc gat cca                      144  
 Arg Leu Asn Phe Gly Gln Thr Gly Asp Ser Glu Ser Val Pro Asp Pro  
     35                      40                      45  
 caa cct ctc gga gaa cct cca gca acc ccc gct gct gtg gga cct act                      192  
 Gln Pro Leu Gly Glu Pro Pro Ala Thr Pro Ala Ala Val Gly Pro Thr  
     50                      55                      60  
 aca atg gct tca ggc ggt ggc gca cca atg gca gac aat aac gaa ggc                      240  
 Thr Met Ala Ser Gly Gly Gly Ala Pro Met Ala Asp Asn Asn Glu Gly  
     65                      70                      75                      80

gcc gac gga gtg ggt aat gcc tca gga aat tgg cat tgc gat tcc aca Ala Asp Gly Val Gly Asn Ala Ser Gly Asn Trp His Cys Asp Ser Thr 85 90 95	288
tgg ctg ggc gac aga gtc atc acc acc agc acc cgc acc tgg gcc ttg Trp Leu Gly Asp Arg Val Ile Thr Thr Ser Thr Arg Thr Trp Ala Leu 100 105 110	336
ccc acc tac aat aac cac ctc tac aag caa atc tcc agt gct tca acg Pro Thr Tyr Asn Asn His Leu Tyr Lys Gln Ile Ser Ser Ala Ser Thr 115 120 125	384
ggg gcc agc aac gac aac cac tac ttc ggc tac agc acc ccc tgg ggg Gly Ala Ser Asn Asp Asn His Tyr Phe Gly Tyr Ser Thr Pro Trp Gly 130 135 140	432
tat ttt gat ttc aac aga ttc cac tgc cac ttt tca cca cgt gac tgg Tyr Phe Asp Phe Asn Arg Phe His Cys His Phe Ser Pro Arg Asp Trp 145 150 155 160	480
cag cga ctc atc aac aac aat tgg gga ttc cgg ccc aag aga ctc aac Gln Arg Leu Ile Asn Asn Asn Trp Gly Phe Arg Pro Lys Arg Leu Asn 165 170 175	528
ttc aaa ctc ttc aac atc caa gtc aag gag gtc acg acg aat gat ggc Phe Lys Leu Phe Asn Ile Gln Val Lys Glu Val Thr Thr Asn Asp Gly 180 185 190	576
gtc aca acc atc gct aat aac ctt acc agc acg gtt caa gtc ttc tcg Val Thr Thr Ile Ala Asn Asn Leu Thr Ser Thr Val Gln Val Phe Ser 195 200 205	624
gac tcg gag tac cag ctt ccg tac gtc ctc ggc tct gcg cac cag ggc Asp Ser Glu Tyr Gln Leu Pro Tyr Val Leu Gly Ser Ala His Gln Gly 210 215 220	672
tgc ctc cct ccg ttc ccg gcg gac gtg ttc atg att ccg caa tac ggc Cys Leu Pro Pro Phe Pro Ala Asp Val Phe Met Ile Pro Gln Tyr Gly 225 230 235 240	720
tac ctg acg ctc aac aat ggc agc caa gcc gtg gga cgt tca tcc ttt Tyr Leu Thr Leu Asn Asn Gly Ser Gln Ala Val Gly Arg Ser Ser Phe 245 250 255	768
tac tgc ctg gaa tat ttc cct tct cag atg ctg aga acg ggc aac aac Tyr Cys Leu Glu Tyr Phe Pro Ser Gln Met Leu Arg Thr Gly Asn Asn 260 265 270	816
ttt acc ttc agc tac acc ttt gag gaa gtg cct ttc cac agc agc tac Phe Thr Phe Ser Tyr Thr Phe Glu Glu Val Pro Phe His Ser Ser Tyr 275 280 285	864
gcg cac agc cag agc ctg gac cgg ctg atg aat cct ctc atc gac caa Ala His Ser Gln Ser Leu Asp Arg Leu Met Asn Pro Leu Ile Asp Gln 290 295 300	912
tac ctg tat tac ctg aac aga act caa aat cag tcc gga agt gcc caa Tyr Leu Tyr Tyr Leu Asn Arg Thr Gln Asn Gln Ser Gly Ser Ala Gln 305 310 315 320	960

aac aag gac ttg ctg ttt agc cgt ggg tct cca gct ggc atg tct gtt Asn Lys Asp Leu Leu Phe Ser Arg Gly Ser Pro Ala Gly Met Ser Val 325 330 335	1008
cag ccc aaa aac tgg cta cct gga ccc tgt tat cgg cag cag cgc gtt Gln Pro Lys Asn Trp Leu Pro Gly Pro Cys Tyr Arg Gln Gln Arg Val 340 345 350	1056
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gca ttg gac aat gtc atg att aca gac gaa gag gaa att aaa gcc act Ala Leu Asp Asn Val Met Ile Thr Asp Glu Glu Glu Ile Lys Ala Thr 420 425 430	1296
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tta cct ggc atg gtg tgg caa gat aga gac gtg tac ctg cag ggt ccc Leu Pro Gly Met Val Trp Gln Asp Arg Asp Val Tyr Leu Gln Gly Pro 465 470 475 480	1440
att tgg gcc aaa att cct cac aca gat gga cac ttt cac ccg tct cct Ile Trp Ala Lys Ile Pro His Thr Asp Gly His Phe His Pro Ser Pro 485 490 495	1488
ctt atg ggc ggc ttt gga ctc aag aac ccg cct cct cag atc ctc atc Leu Met Gly Gly Phe Gly Leu Lys Asn Pro Pro Pro Gln Ile Leu Ile 500 505 510	1536
aaa aac acg cct gtt cct gcg aat cct ccg gcg gag ttt tca gct aca Lys Asn Thr Pro Val Pro Ala Asn Pro Pro Ala Glu Phe Ser Ala Thr 515 520 525	1584
aag ttt gct tca ttc atc acc caa tac tcc aca gga caa gtg agt gtg Lys Phe Ala Ser Phe Ile Thr Gln Tyr Ser Thr Gly Gln Val Ser Val 530 535 540	1632
gaa att gaa tgg gag ctg cag aaa gaa aac agc aag cgc tgg aat ccc Glu Ile Glu Trp Glu Leu Gln Lys Glu Asn Ser Lys Arg Trp Asn Pro 545 550 555 560	1680

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 Glu Val Gln Tyr Thr Ser Asn Tyr Ala Lys Ser Ala Asn Val Asp Phe  
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act gtg gac aac aat gga ctt tat act gag cct cgc ccc att ggc acc 1776  
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 35 40 45

Gln Pro Leu Gly Glu Pro Pro Ala Thr Pro Ala Ala Val Gly Pro Thr  
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Thr Met Ala Ser Gly Gly Gly Ala Pro Met Ala Asp Asn Asn Glu Gly  
 65 70 75 80

Ala Asp Gly Val Gly Asn Ala Ser Gly Asn Trp His Cys Asp Ser Thr  
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Trp Leu Gly Asp Arg Val Ile Thr Thr Ser Thr Arg Thr Trp Ala Leu  
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Pro Thr Tyr Asn Asn His Leu Tyr Lys Gln Ile Ser Ser Ala Ser Thr  
 115 120 125

Gly Ala Ser Asn Asp Asn His Tyr Phe Gly Tyr Ser Thr Pro Trp Gly  
 130 135 140

Tyr Phe Asp Phe Asn Arg Phe His Cys His Phe Ser Pro Arg Asp Trp  
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Gln Arg Leu Ile Asn Asn Asn Trp Gly Phe Arg Pro Lys Arg Leu Asn  
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Phe Lys Leu Phe Asn Ile Gln Val Lys Glu Val Thr Thr Asn Asp Gly  
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Val Thr Thr Ile Ala Asn Asn Leu Thr Ser Thr Val Gln Val Phe Ser  
 195 200 205

Asp Ser Glu Tyr Gln Leu Pro Tyr Val Leu Gly Ser Ala His Gln Gly

210 215 220  
 Cys Leu Pro Pro Phe Pro Ala Asp Val Phe Met Ile Pro Gln Tyr Gly  
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 Tyr Leu Thr Leu Asn Asn Gly Ser Gln Ala Val Gly Arg Ser Ser Phe  
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 Tyr Cys Leu Glu Tyr Phe Pro Ser Gln Met Leu Arg Thr Gly Asn Asn  
 260 265 270  
 Phe Thr Phe Ser Tyr Thr Phe Glu Glu Val Pro Phe His Ser Ser Tyr  
 275 280 285  
 Ala His Ser Gln Ser Leu Asp Arg Leu Met Asn Pro Leu Ile Asp Gln  
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 Tyr Leu Tyr Tyr Leu Asn Arg Thr Gln Asn Gln Ser Gly Ser Ala Gln  
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 Ser Lys Thr Lys Thr Asp Asn Asn Asn Ser Asn Phe Thr Trp Thr Gly  
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 Ala Ser Lys Tyr Asn Leu Asn Gly Arg Glu Ser Ile Ile Asn Pro Gly  
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 Thr Ala Met Ala Ser His Lys Asp Asp Glu Asp Lys Phe Phe Pro Met  
 385 390 395 400  
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 Ala Leu Asp Asn Val Met Ile Thr Asp Glu Glu Glu Ile Lys Ala Thr  
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 Ser Ser Ser Thr Asp Pro Ala Thr Gly Asp Val His Ala Met Gly Ala  
 450 455 460  
 Leu Pro Gly Met Val Trp Gln Asp Arg Asp Val Tyr Leu Gln Gly Pro  
 465 470 475 480  
 Ile Trp Ala Lys Ile Pro His Thr Asp Gly His Phe His Pro Ser Pro  
 485 490 495  
 Leu Met Gly Gly Phe Gly Leu Lys Asn Pro Pro Pro Gln Ile Leu Ile  
 500 505 510  
 Lys Asn Thr Pro Val Pro Ala Asn Pro Pro Ala Glu Phe Ser Ala Thr  
 515 520 525  
 Lys Phe Ala Ser Phe Ile Thr Gln Tyr Ser Thr Gly Gln Val Ser Val

530

535

540

Glu Ile Glu Trp Glu Leu Gln Lys Glu Asn Ser Lys Arg Trp Asn Pro  
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Glu Val Gln Tyr Thr Ser Asn Tyr Ala Lys Ser Ala Asn Val Asp Phe  
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Arg Tyr Leu Thr Arg Pro Leu  
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Asp Gly Val Gly Asn Ala Ser Gly Asn Trp His Cys Asp Ser Thr Trp  
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ctg ggc gac aga gtc atc acc acc agc acc cgc acc tgg gcc ttg ccc 144  
Leu Gly Asp Arg Val Ile Thr Thr Ser Thr Arg Thr Trp Ala Leu Pro  
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acc tac aat aac cac ctc tac aag caa atc tcc agt gct tca acg ggg 192  
Thr Tyr Asn Asn His Leu Tyr Lys Gln Ile Ser Ser Ala Ser Thr Gly  
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gcc agc aac gac aac cac tac ttc ggc tac agc acc ccc tgg ggg tat 240  
Ala Ser Asn Asp Asn His Tyr Phe Gly Tyr Ser Thr Pro Trp Gly Tyr  
65 70 75 80

ttt gat ttc aac aga ttc cac tgc cac ttt tca cca cgt gac tgg cag 288  
Phe Asp Phe Asn Arg Phe His Cys His Phe Ser Pro Arg Asp Trp Gln  
85 90 95

cga ctc atc aac aac aat tgg gga ttc cgg ccc aag aga ctc aac ttc 336  
Arg Leu Ile Asn Asn Asn Trp Gly Phe Arg Pro Lys Arg Leu Asn Phe  
100 105 110

aaa ctc ttc aac atc caa gtc aag gag gtc acg acg aat gat ggc gtc 384  
Lys Leu Phe Asn Ile Gln Val Lys Glu Val Thr Thr Asn Asp Gly Val  
115 120 125

aca acc atc gct aat aac ctt acc agc acg gtt caa gtc ttc tcg gac 432  
Thr Thr Ile Ala Asn Asn Leu Thr Ser Thr Val Gln Val Phe Ser Asp

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Ser Glu Tyr Gln Leu Pro Tyr Val Leu Gly Ser Ala His Gln Gly Cys			
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ctc cct ccg ttc ccg gcg gac gtg ttc atg att ccg caa tac ggc tac			528
Leu Pro Pro Phe Pro Ala Asp Val Phe Met Ile Pro Gln Tyr Gly Tyr			
	165	170	175
ctg acg ctc aac aat ggc agc caa gcc gtg gga cgt tca tcc ttt tac			576
Leu Thr Leu Asn Asn Gly Ser Gln Ala Val Gly Arg Ser Ser Phe Tyr			
	180	185	190
tgc ctg gaa tat ttc cct tct cag atg ctg aga acg ggc aac aac ttt			624
Cys Leu Glu Tyr Phe Pro Ser Gln Met Leu Arg Thr Gly Asn Asn Phe			
	195	200	205
acc ttc agc tac acc ttt gag gaa gtg cct ttc cac agc agc tac gcg			672
Thr Phe Ser Tyr Thr Phe Glu Glu Val Pro Phe His Ser Ser Tyr Ala			
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cac agc cag agc ctg gac cgg ctg atg aat cct ctc atc gac caa tac			720
His Ser Gln Ser Leu Asp Arg Leu Met Asn Pro Leu Ile Asp Gln Tyr			
	225	230	235
ctg tat tac ctg aac aga act caa aat cag tcc gga agt gcc caa aac			768
Leu Tyr Tyr Leu Asn Arg Thr Gln Asn Gln Ser Gly Ser Ala Gln Asn			
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aag gac ttg ctg ttt agc cgt ggg tct cca gct ggc atg tct gtt cag			816
Lys Asp Leu Leu Phe Ser Arg Gly Ser Pro Ala Gly Met Ser Val Gln			
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ccc aaa aac tgg cta cct gga ccc tgt tat cgg cag cag cgc gtt tct			864
Pro Lys Asn Trp Leu Pro Gly Pro Cys Tyr Arg Gln Gln Arg Val Ser			
	275	280	285
aaa aca aaa aca gac aac aac aac agc aat ttt acc tgg act ggt gct			912
Lys Thr Lys Thr Asp Asn Asn Asn Ser Asn Phe Thr Trp Thr Gly Ala			
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Ser Lys Tyr Asn Leu Asn Gly Arg Glu Ser Ile Ile Asn Pro Gly Thr			
	305	310	315
gct atg gcc tca cac aaa gac gac gaa gac aag ttc ttt ccc atg agc			1008
Ala Met Ala Ser His Lys Asp Asp Glu Asp Lys Phe Phe Pro Met Ser			
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ggt gtc atg att ttt gga aaa gag agc gcc gga gct tca aac act gca			1056
Gly Val Met Ile Phe Gly Lys Glu Ser Ala Gly Ala Ser Asn Thr Ala			
	340	345	350
ttg gac aat gtc atg att aca gac gaa gag gaa att aaa gcc act aac			1104
Leu Asp Asn Val Met Ile Thr Asp Glu Glu Glu Ile Lys Ala Thr Asn			
	355	360	365
cct gtg gcc acc gaa aga ttt ggg acc gtg gca gtc aat ttc cag agc			1152
Pro Val Ala Thr Glu Arg Phe Gly Thr Val Ala Val Asn Phe Gln Ser			

370	375	380	
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Ser Ser Thr Asp Pro	Ala Thr Gly Asp Val	His Ala Met Gly Ala Leu	
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cct ggc atg gtg tgg	caa gat aga gac gtg	tac ctg cag ggt ccc att	1248
Pro Gly Met Val Trp	Gln Asp Arg Asp Val	Tyr Leu Gln Gly Pro Ile	
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tgg gcc aaa att cct	cac aca gat gga	cac ttt cac ccg tct cct ctt	1296
Trp Ala Lys Ile Pro	His Thr Asp Gly	His Phe His Pro Ser Pro Leu	
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Met Gly Gly Phe Gly	Leu Lys Asn Pro	Pro Pro Gln Ile Leu Ile Lys	
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ttt gct tca ttc atc	acc caa tac tcc aca	gga caa gtg agt gtg gaa	1440
Phe Ala Ser Phe Ile	Thr Gln Tyr Ser Thr	Gly Gln Val Ser Val Glu	
	465 470	475 480	
att gaa tgg gag ctg	cag aaa gaa aac agc	aag cgc tgg aat ccc gaa	1488
Ile Glu Trp Glu Leu	Gln Lys Glu Asn Ser	Lys Arg Trp Asn Pro Glu	
	485 490	495	
gtg cag tac aca tcc	aat tat gca aaa tct	gcc aac gtt gat ttt act	1536
Val Gln Tyr Thr Ser	Asn Tyr Ala Lys Ser	Ala Asn Val Asp Phe Thr	
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gtg gac aac aat gga	ctt tat act gag cct	cgc ccc att ggc acc cgt	1584
Val Asp Asn Asn Gly	Leu Tyr Thr Glu Pro	Arg Pro Ile Gly Thr Arg	
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 35 40 45  
 Thr Tyr Asn Asn His Leu Tyr Lys Gln Ile Ser Ser Ala Ser Thr Gly  
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Ala Ser Asn Asp Asn His Tyr Phe Gly Tyr Ser Thr Pro Trp Gly Tyr  
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 Ser Glu Tyr Gln Leu Pro Tyr Val Leu Gly Ser Ala His Gln Gly Cys  
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 Cys Leu Glu Tyr Phe Pro Ser Gln Met Leu Arg Thr Gly Asn Asn Phe  
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 Thr Phe Ser Tyr Thr Phe Glu Glu Val Pro Phe His Ser Ser Tyr Ala  
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Ser Ser Thr Asp Pro Ala Thr Gly Asp Val His Ala Met Gly Ala Leu  
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